

C.A.S.H. 30TH ANNUAL CONFERENCE ON SCHOOL FACILITIES

30 YEARS OF SCHOOL FACILITIES LEADERSHIP ADVOCACY ♦ EDUCATION ♦ COLLABORATION

Wednesday, February 25, 2009
2:30 p.m. - 4:00 p.m.
Sacramento Convention Center
Room 309

Workshop # 37

Green Dollars Equal Green Schools: Sustainable and Affordable – New and Renovated Green Schools

Moderator:

George Parker

Yuba City Unified School District
(530) 822-5253
gparker@ycusd.k12.ca.us

Panelists:

Mike Kozlowski

ANOVA Architects, Inc.
(530) 626-1810
mkozlowski@anovaarchitects.com

Scott Price

Glendale Unified School District
(818) 241-3111
sprice@gusd.net

Green Dollars Equal Green Schools: Sustainable and affordable – New and renovated Green schools



Michael Kozlowski, AIA, LEED AP

Panel Discussion

30th C.A.S.H. Conference on School facilities

February 25, 2009

ANOVΛ
ARCHITECTS
MURRAY DOWNS OSHIMA YEE

GREEN VALUE, GREEN VALUES



The essence of both the CHPS and the LEED for Schools programs are the same, saving energy and improving our learning environments. The byproducts are, if managed properly, money and better educated children. Every dollar not spent on gas, water or electricity can be banked for facility maintenance, staffing, or expanding educational programs.

GREEN VALUE, GREEN VALUES



Basic elements of CHPS and LEED

- District commitment
- Site selection
- Quality indoor environments
- Responsible material selection
- Water conservation
- Energy conservation
- Training
- Commissioning
- Innovation.

These are not the exact categories of either but represent the overall thrust of both programs. You will find both to be very similar to the point of almost complete overlap. Making a commitment to the CHPS or LEED principles as a district or as a facilities team, much like saving for retirement is easier the sooner you start.

GREEN VALUE, GREEN VALUES



Basic elements of CHPS and LEED

- Both programs are points based and the score that you achieve is dependent on a number of factors relating to the categories listed. Just like in school the harder you work the higher your test score is likely to be. Unfortunately, like in life, high test scores do not always determine your ultimate success.
- Both CHPS and LEED can be viewed as a menu and responsible district administrators, Facilities staff and Designers need to be aware of the cost of each menu item and what value it provides.
- Make the first step of any project deciding on the green values that will be pursued. Once the values are laid out, informed decisions can occur.

COMMODITAS, FIRMITAS



The simple stuff, Commodity

- Use the land you need and no more.
- Minimize energy and water usage.
- Know the cost of operating everything.
- Select sites that minimize auto and bus trip generation.
- Select materials for durability.

The less simple stuff, Firmness

- Make your own power. (Grid neutral now! Ask me how!)
- Everyone should know how the buildings work and how they work best.
- Plan your sites, buildings and maintenance budgets for 100 years.

& VENUSTAS



The Complicated stuff, Delight

- Learning and work spaces should be well lit. A combination of daylight and controllable scene, task lighting is best.
- Learning and work spaces should be able to be quiet and acoustically neutral.
- Learning spaces should be a comfortable temperature for the activities of the space and adaptable to varying activities and external temperatures.
- Learning and work spaces should be free of materials that degrade over time in a harmful way or require maintenance that introduces toxins.
- Buildings should address the specific needs of educational programs but retain a measure of adaptability.
- Understanding the green values employed by your school or school district should be part of the curriculum at all ages.

SHOPPING LIST



Steps for future project planning

- Establish your District energy use goals.
- Establish a goal for grid neutrality.
- Establish a district wide monitoring standard for energy use and person to oversee the program.
- Test your classrooms for acoustic properties.
- Survey all your equipment for Energy star ratings and life costs.

- Make your roofs white.
- Use more insulation, and better weather stripping, windows and doors.
- Get the most efficient HVAC equipment available.
- Determine how you will use the HVAC and stick to it.
- Change all your light bulbs and fixtures to high efficiency models.
- Change bathroom fixtures to multi-flush or no-flush models.

Glendale Unified School District



Conservation Guidelines

Adopted by the Board of Education
August 19, 2008

Energy Conservation and Building Management Guidelines

Table of Contents

Board Policy

Building Benchmarks

- Hours of Operation
- High Schools
- Middle Schools
- Elementary Schools
- Lighting
- Temperature – Cooling Season
- Temperature – Heating Season
- Irrigation
- Small Appliances
- Information Exchange

GUSD Staff Expectations

Individual Responsibilities

- Board of Education
- Superintendent
- District Staff
- Energy Manager
- Principal
- Supervisor/Director
- Teacher
- Clerical
- Custodial
- Kitchen Staff
- Technology Staff
- Maintenance Staff
- Contractor Responsibilities
- Planning and Development
- Temporary Facility Users

Conservation Guidelines Committee Members

Glendale Unified School District Board Policy on Conservation (BP 3511)

The Board of Education is committed to reducing the District's usage of electricity, natural gas, and water to conserve natural resources and to save money to support other identified priorities. In this regard, the Superintendent or designee shall establish and maintain an energy conservation program which shall include strategies designed to provide for the more efficient use of electrical, gas, and water resources.

Additionally, the Superintendent or designee shall:

- A. Encourage all management, certificated, classified staff, and students to conserve energy at all District facilities. All staff and students will be expected to assist the District in conserving energy and water.
- B. Analyze the effect of utility rate increases on the District budget and develop and implement necessary contingency plans.
- C. Analyze specific site usage patterns and work cooperatively with site administration and staff to identify and implement specific conservation measures.
- D. Establish and maintain working Energy Guidelines that specify District standards regarding energy use and conservation techniques based on industry standards
- E. Inspect District facilities and operations and make recommendations for maintenance and capital expenditures which may help the District achieve the more efficient use of energy and reduce irrigation needs.
- F. Identify funding opportunities and incentive programs to assist the District in achieving its conservation goals.
- G. Consider alternative energy sources as may be appropriate.

The Superintendent or designee designates the following positions to coordinate the District's energy tracking, reporting, and conservation efforts:

Chief Business and Financial Officer; Administrator, Business Services; and Energy Conservation Manager.

District and school-site plans to conserve resources shall address energy and water use, including plans for:

- A. Reducing energy use during high-peak hours
- B. Reducing lighting and equipment use when facilities are otherwise closed
- C. Shutting down facility and classroom equipment when not in use

The following operations shall also be reviewed to further the District's energy and water conservation goals:

- A. Educational programs
- B. Classroom and building management and maintenance
- C. Food services and equipment maintenance
- D. Landscaping selection and irrigation
- E. Transportation services and maintenance
- F. New construction
- G. Administrative operations
- H. Use of facilities by outside groups

To enlist the support which is essential to achieving the District's energy and water conservation goals, the principal at each site shall:

- A. Solicit input from staff, students, and parents/guardians related to District energy and water use
- B. Develop strategies designed to ensure cooperation from students and staff in all conservation efforts
- C. Recognize those who reduce energy and water use.

Energy Conservation and Building Management Guidelines

Energy Guidelines

The energy guidelines outlined in this document are a standard. This document is not intended to be “all inclusive” for every situation but is designed to set a standard for most situations

Building Benchmarks

Hours of operation

- Building temperatures in classroom areas will be maintained until one half hour after students are dismissed.
- Other building spaces will be controlled to match the usage of the building.
- As a result of delayed building temperature response, runtimes schedules will be set to maintain appropriate climate during unoccupied times.
- All GUSD-sanctioned programs will be provided with “occupied” climate conditions, provided zone control is available in the space the group will be using.
- Refrigerated vending machines will be turned off when not intended to be used for a period of 16 hours or more. Display case/front lighting on all vending machines will be disconnected by the vendor.
- All domestic hot water systems are set no higher than 120 degrees Fahrenheit or 140 degrees Fahrenheit for cafeteria service (with dishwasher booster).
- All domestic hot water re-circulating pumps are switched off during unoccupied times.
- A 6 degree Fahrenheit band between heating and cooling enable points will be maintained.
- Buildings will achieve full interior lighting conditions 30 minutes prior to scheduled start time.
- Buildings will be unlocked and open for service 30 minutes or less prior to scheduled start time.
- All site keys will be turned in to administration or designee at end of the school year.
- For summer and/or night programs, consolidate classroom usage to a central area or building that is individually cooled/heated.

High Schools

- Gym will remain in the occupied mode until 4 pm Monday – Friday unless in use.
- Media Center will remain in the occupied mode until 4 pm Monday – Friday unless in use.
- Cafeteria will remain in the occupied mode until 3 pm Monday – Friday unless in use.
- Buildings will maintain exterior light during the school year until 11:30 pm, Monday – Friday unless in use.

Middle Schools

- Gym will remain in the occupied mode until 4 pm Monday – Friday unless in use.
- Media Center will remain in the occupied mode until 4 pm Monday – Friday unless in use.
- Cafeteria will remain in the occupied mode until 3 pm Monday – Friday unless in use.
- Buildings will maintain exterior light during the school year until 11:30 pm, Monday – Friday unless in use.

Elementary Schools

- Gym will remain in the occupied mode until 4 pm Monday – Friday unless in use.
- Media Center will remain in the occupied mode until 4 pm Monday – Friday unless in use.
- Buildings will be unlocked early and keep appropriate lighting levels to accommodate all latch key and/or childcare programs.
- Buildings will maintain exterior lighting during the school year until 11:30 pm, Monday – Friday unless in use.
- Cafeteria will remain in the occupied mode until 2 pm Monday – Friday unless in use.

Lighting

- All unnecessary lighting in unoccupied areas will be turned off.
- Utilize natural lighting where appropriate.
- All outside lighting will be off during daylight hours.

- All lights will be turned off when the building closes for the evening. Custodians will turn on lights only in the areas in which they are working.
- Refrain from turning lights on unless definitely needed. Utilize 1 lamp switching whenever possible. Lights consume electricity and give off heat that places an additional load on the air conditioning equipment.
- Both interior and exterior lights will be turned off each day after the buildings are locked for the night, with the exception of security lighting. Times will be adjusted for seasonal change.
- The amount of lighting used for athletic events should be appropriate for the activity and used only when necessary. Use appropriate partial lighting for after-hours activities (i.e. partial banks of lights for practice or group meeting).
- Exterior lights will remain on for all GUSD-sanctioned events taking place within the building.
- Exterior lights will be turned on and off where appropriate to accommodate staff entering and leaving the building at unusual hours.
- Security lighting should be used appropriately and adjusted dependent on campus layout.

Temperature

- Hours of operation for HVAC
 - High Schools: 7 am – 4 pm
 - Middle Schools: 7 am – 3:30 pm
 - Elementary Schools: 7:30 am – 3:30 pm
 - *30 minute overrides

Cooling Season

Cooling Season Occupied Set Point: 74 degrees Fahrenheit

Unoccupied set point: 90-95 degrees Fahrenheit

- While attempting to maintain a consistent temperature, normal fluctuations may occur due to cycling mechanical equipment, direct sunlight, changes in occupancy, etc. Normal fluctuations should be within +/- 2 degrees of stated set point.
- Air conditioning start times may be adjusted (depending on weather) to ensure classroom comfort when school begins.

- Ensure outside air dampers are closed during unoccupied times.
- Ceiling fans should be operated in all areas that have them.
- Air conditioning should not be utilized in classrooms during the summer months unless the classrooms are being used for summer school or year-round school.
- Where cross-ventilation is available during periods of mild weather, HVAC equipment should be shut down and the temperature adjusted with windows and doors. Cross-ventilation is defined as having windows and/or doors to the outside on each side of a room.
- The Energy Manager will monitor and adjust set points for individual cases as needed.

Heating Season

Heating Season Occupied Set Point: 68 degrees Fahrenheit

Unoccupied Set Point: 35-45 Fahrenheit

- While attempting to maintain a consistent temperature, normal fluctuations may occur due to cycling mechanical equipment, direct sunlight, changes in occupancy, etc. Normal fluctuations should be within +/- 2 degrees of stated set point.
- During the spring and fall, all steam and forced air heating systems should be switched off during unoccupied times. Hot water heating systems should be switched off using the appropriate loop pumps.

Irrigation

- All watering will be done between 5-10 a.m.
- When spray irrigating, the water will not hit the building.
- The areas directly in front of each facility will be irrigated.
- Some areas may experience limited irrigation during the summer months.
- Athletic fields will be irrigated for fall use.
- Turn off irrigation system during rain.

Small Appliances

- Refrigerators, microwaves, and coffee pots should be in convenient central locations that are accessible to employees in identified work locations and not in classrooms and/or offices except in cases of curricular needs (eg. Science), individual medical needs, or, if

approved by the Energy Manager in consultation with the site principal, for evening extra curricular use or other extenuating circumstances.

- If no common areas are physically available, a classroom may be designated as a “common area” for a group of classrooms or offices if mutually agreed upon by site personnel.
- The process of identifying common areas and removing small appliances from office spaces and classrooms will occur at each site by November 30, 2008 and be reviewed annually.
- The Energy Manager will support the process of identifying common areas by providing diagrams of the school facilities and presenting options to site administration and staff. Site administration and staff will determine the final location of the common areas at their sites.
- All appliances will be emptied and unplugged over extended vacation periods (spring break, winter break, and summer vacation).

GUSD Staff Expectations

- Employees will ensure doors between conditioned space and non-conditioned space remain closed at all times. (i.e. classroom doors will remain closed when HVAC is operating)
- Thermostats should be adjusted within the energy management program guidelines.
- Lights should be turned off when leaving the room even at rooms with occupancy sensors.
- All exhaust fans should be off at the end of every day and during unoccupied hours.
- All office machines (copy machines, laminating equipment, etc.) will be switched off each night and during occupied times when not in use.
- Fax machines should remain ON.
- All computers should be turned off each night --- this includes the monitor, local printer, and speakers. Network equipment is excluded.

Individual Expectations

Board of Education Members

- Support and endorse the energy program.
- Encourage district employees to comply with the energy guidelines.
- Communicate concerns about conservation programs to the Superintendent.

Superintendent Responsibilities

- Regularly meets with staff or the energy manager to monitor program.
- Maintains district awareness of the energy program.

District Administration

- Maintains accurate records of energy consumption and energy costs
- Provides an annual report outlining progress of the energy conservation program to the Board of Education
- In cooperation with the Energy Manager, makes any determination necessary to conserve energy while maintaining an appropriate educational environment.
- Finds ways to provide incentives to school sites for conserving resources

Energy Manager Responsibilities

- Performs routine audits of all facilities and communicates the audit results to the appropriate personnel.
- Provides regular reports to Principals, Administrators, and community indicating performance with regard to energy savings.
- Assures that proper and thorough utilization of data loggers will be initiated and maintained to monitor relative humidity, temperature, and light levels throughout the district's buildings to ensure compliance with district guidelines.
- Conducts an energy-training program for maintenance, grounds, and custodial staff that provides specific steps, tailored to each school on how to reduce energy waste.
- Develops organized shutdown procedures to turn off additional equipment during daily or extended unoccupied times..
- Monitor and analyzes utility bills.
- Sets annual benchmarks and goals.
- Develops set points during heating and cooling seasons based on industry standards.
- Determines air conditioning seasonal start up and daily starts to ensure classroom comfort for instructional program.
- Determine lighting utilization in occupied and unoccupied areas.

- Encourages behavior promoting energy conservation and best practices.
- Maintains a high level of awareness on energy efficiency.
- Utilizes checklists to communicate appropriate behaviors.
- Identifies and resolves issues related the energy management program.
- Educates GUSD staff about energy consumption.
- Improves building mechanical control to maximize energy savings.
- Develops building energy teams.
- Sends reminders to shut off and unplug equipment during extended break periods.

Principal Responsibilities

- Maintains responsibility for the total energy usage of his/her building.
- Schedules the use of classrooms and other spaces wisely and with the coordination of the Energy Manager to reduce energy consumption.
- Ensures building thermostat settings remain within the guidelines of the energy management program.
- Keeps a focus of energy management among staff throughout the year and utilizes data to evaluate progress.

- Maintains ongoing communication with the Energy Manager to ensure optimum learning conditions.
- Solicits suggestions from staff for better building efficiency.
- Ensures that during times of extreme weather that HVAC systems will be turned on prior to the start of school.
- Schedules custodial staff during summer vacations and extended breaks to a day shift to maximize conservation savings.
- Works with the Energy Manager and site employees to create a plan for common areas that provide employees with access to refrigerators and microwaves for personal use.

Supervisor/Director Responsibilities

- Responsible for the total energy usage of his/her department.
- Schedules the use of rooms and other spaces wisely and with the coordination of the Energy Manager to reduce energy consumption.
- Ensures department thermostat settings remain within the guidelines of the energy management program.
- Keeps a focus of energy management among staff throughout the year and utilizes data to evaluate progress.
- Establishes ongoing communication with the Energy Manager to ensure optimum learning conditions.
- Solicits suggestions from staff for better building efficiency.

Teacher Responsibilities

- Closes blinds and drapes on windows that receive direct sunlight when air conditioning systems are on and at night during the winter months and closes doors and windows when heating or cooling systems are in use.
- Keeps classroom area air supply and return grills clear of furniture or displays.
- Keeps thermostats accessible, without a heat source nearby such as a computer monitors, copiers, lamps, etc.
- Keeps thermostats within the energy management program guidelines
- Reports faulty thermostats and other equipment that may be malfunctioning.
- Makes certain that lights are turned off when leaving the classroom empty.
- Turns off all ceiling fans when leaving the classroom.
- Encourages students to dress appropriately for the weather.
- Additional teaching equipment requiring electricity such as aquariums, should be limited to that utilized for direct instruction.

Clerical Responsibilities

- Closes blinds or drapes on windows that receive direct sunlight when air conditioning systems are on and at night during the winter months.
- Keeps office area air supply and return grills clear of furniture or displays.
- Keeps thermostats accessible, without a heat source nearby such as a computer monitors, copiers, lamps, etc.
- Keeps thermostats within the energy management program guidelines.
- Reports faulty thermostats and other equipment that may be malfunctioning.
- Makes certain that lights are turned off when leaving the office empty.
- Turns off all wall and floor fans when leaving the office.

Custodial Staff Responsibilities

- Controls temperature of common areas, i.e. halls, cafeteria, etc.
- Verifies the nighttime shutdown.
- Checks for proper thermostat settings and functions. Checks for overheated and overcooled areas and communicates this information to the Energy Manager.
- Turns off lights in unused spaces.
- Turns off all exhaust fans every night or during unoccupied hours unless necessary for indoor air quality.
- Follows procedures for setbacks/shutdowns during weekends and vacations.
- Adjust custodial start time to earlier during breaks and summers.
- Utilizes daily, weekend, and holiday shutdown lists.
- Responds to building requests for climate control only when rooms/spaces are outside Energy Management Guidelines.
- Communicates to the Energy Manager the spaces in district buildings that fall outside the guidelines.
- Maintains set points for heating and cooling unless authorized by appropriate personnel.
- Adjusts building run times to coincide with the seasons of the year and changes in daylight savings time.
- Adjusts schedules during breaks and summers to daytime schedules. Uses the team cleaning concept during summer months

Food Service Staff Responsibilities

- Efficiently utilizes kitchen equipment during periods of food preparation.
- Appropriately monitors kitchen equipment, turning it on for usage time only. Pre-heat should follow posted equipment guidelines.
- Assists coordination efforts during extended break periods, taking appropriate measures to turn off unnecessary equipment.
- Works with custodial staff to coordinate shutdown activities and maintenance.

Technology Staff Responsibilities

- Programs a limited number of computers to come on during occupied times and all computers to turn off at a designated time (15 minutes or sooner after the scheduled end-of-school day).
- Programs all capable PC's for the "energy saver" mode using the power management feature. If network constraints are restrictive, ensure the monitor "sleeps" after 10 minutes of inactivity.

Maintenance Staff Responsibilities

- Verifies HVAC equipment is running properly and achieving night setback temperatures.
- Identifies equipment unresponsive to GUSD controls and shares information with the Energy Manager.
- Consistently sets equipment to district guidelines unless authorized by appropriate personnel.
- Checks and repairs as necessary, all building insulation, caulking and weather-stripping.
- Inspects heating and air conditioning equipment according to schedule.
- Replaces worn seals, fittings, traps, etc. and check ducts for leakage.
- Keeps refrigerator compressors and condensers clean.
- Inspects drinking fountains for proper operation and leaks.
- Checks all plumbing for leaks.
- Secures all attic and roof hatches.
- Keeps doors in good working condition.
- Repairs damaged windows and doors as soon as possible.
- Ensures all plumbing and/or intrusion (i.e. roof) leaks are reported and repaired immediately.
- Develops and implements a preventative maintenance and monitoring plan for its facilities and systems including heating and cooling.

- Installs timers on equipment where feasible to conserve energy
- Keeps HVAC Equipment (filters & coils) clean and lubricated
- Replaces dislodged, broken, or missing ceiling tiles
- Maintains consistent settings with the EMS system unless authorized by appropriate personnel

Contractor Responsibilities

- Adhere to the GUSD energy conservation and building management guidelines.
- Turn off all work equipment at the end of the work day.
- Keep doors and windows closed unless moving equipment/materials in and out of the buildings.
- Leave HVAC systems off unless authorized by Energy Manager or district authority.
- Program/Set the HVAC systems to the GUSD standards.

Planning & Development Responsibilities

- When planning and carrying out new construction, modernization or deferred maintenance, the District Planning & Development, will make every effort to exceed the energy efficiency standards outlined in Title 24 of the California Building Codes.
- To reduce initial cost, the District shall seek out and apply for all appropriate grants, rebates, or discounts from utility providers, state, or any other source from which said grants, rebates, or discounts are available.

Temporary Facility Users

- Receives and implements energy guideline requirements from the Business Office.

Version 08/19/2008

Superintendent's Advisory Committee

Energy Conservation Guidelines

Committee Members

<u>Name</u>		<u>Representing</u>
Maureen	Anami	FASO
Scott	Anderle	Site Administrator
Liz	Arnold	Council PTA President
Mary	Boger	Board Member
Tami	Carlson	GTA
Richard	Carroll	CSEA
Becky	Chaires	CSEA
Chris	Coulter	Site Administrator
Daniel	Dimundo	Site Teacher
Liz	Goodknight	Facilitator
Hector	Gutierrez	Glendale Water & Power
Matt	Hamo	Site Teacher
Alicia	Harris	GTA
Greg	Krikorian	Board Member
Agnes	Lally	Food Services
Barbara	Martinez	Site Custodial
Linda	Milano	Principal
John	Mundweil	ABC Committee
Scott	Price	Facilitator
Suzanne	Risse	Principal
Angelo	Rocca	Site Custodial
Gabriel	Santos	FASO